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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,648	11/14/2003	Gynheung An	20010-04USA	1653
JHK Law P.O. Box 1078 La Canada, CA 91012-1078			EXAMINER KUMAR, VINOD	
			ART UNIT 1638	PAPER NUMBER
			MAIL DATE 06/27/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/713,648

Applicant(s)

AN'ET AL.

Examiner

Vinod Kumar

Art Unit

1638

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 38-40 and 50-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 38-40 and 50-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Status of objections and rejections

1. Office acknowledges the receipt of Applicant's response filed on April 18, 2007. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. Claims 38-40, and 50-55 are pending. Claims 38-40, and 50-55 are examined on merits in the instant Office action. All previous claim objections and rejections not set forth below have been withdrawn in view of claim amendments. This action is made FINAL.

Election/Restrictions

2. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

3. Claims 38, 39, 50, 51, 52, and 55 are objected to because of the following informalities:

In claim 38, line 2, replace "a" after "comprising" and before "genomic" with --the-

--.

In claim 39, line 2, replace "an" after "comprising" and before "amino acid" with --the--.

In claim 50, line 2, insert --of same species-- after "a wild-type plant" and before ", produced".

In claim 50, line 4, replace "an" after "comprising" and before "amino acid" with --the--.

In claim 51, line 5, insert --of-- before "SEQ ID NO: 63".

In claims 52 and 55, line 1, replace "modified" with --transformed--.

In claim 55, it is suggested to delete "and expressing" in line 2, and insert --, and wherein said seed expresses the nucleic acid sequence-- at the end of claim.

Appropriate action/corrections are required.

Claim Rejections - 35 USC § 112

4. Claims 38-40, and 50-55 remain rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a genetically transformed rice plant comprising disruption of its endogenous genomic sequence of SEQ ID NO: 29 encoding the polypeptide of SEQ ID NO: 63, and wherein said disruption is due to the insertion of a T-DNA sequence in said genomic sequence, or a transgenic plant or seed transformed with a nucleotide sequence encoding the polypeptide of SEQ ID NO: 63, does not reasonably provide enablement for a) a nucleic acid sequence which increases or decreases the expression activity of a protein of SEQ ID NO: 63, and b) introducing and expressing a nucleic acid sequence encoding SEQ ID NO: 63 in a seed by a method other than transformation. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims for the reasons of record stated in

previous Office action mailed on 10/20/2006. This rejection is also necessitated due to claim amendment filed in the paper of April 18, 2007. Applicant traversal filed in the paper of April 18, 2007 did not include any arguments.

Claim 50 is directed to any nucleic acid sequence which has the ability to increase or decrease the expression activity of SEQ ID NO: 63 in said plant. The claim encompasses overexpression or suppression of endogenous nucleic acid sequence encoding SEQ ID NO: 63 by any nucleic acid sequence which has been introduced into a plant. The claim also encompasses any transgenic nucleic acid sequence having the ability to increase or decrease the activity of endogenous SEQ ID NO: 63 protein in said plant. The claim encompasses transgenic sequence(s) that are unrelated to the endogenous nucleic acid sequence encoding the polypeptide of SEQ ID NO: 63. Applicant's attention is drawn to pages 10-11 of Office action mailed on 10/20/2006, wherein Office has clearly discussed various issues related to unpredictability of overexpressing a nucleic acid sequence encoding a protein which has less than 100% sequence identity to instant SEQ ID NO: 63. Applicant's attention is also drawn to pages 12 to 13 of Office action mailed on 10/20/2006, wherein issues related to the unpredictability of using antisense or cosuppression based approaches of decreasing expression of an endogenous nucleic acid sequence are discussed. Applicants have failed to address these issues in their response of April 18, 2007.

Claim 55 is directed to a genetically modifying a seed by introducing and expressing a nucleic acid sequence into said seed. The specification provides guidance on making genetically modified seed by transforming and expressing a nucleic acid sequence encoding SEQ ID NO: 63. But specification does not provide guidance on

making a genetically modified seed comprising introducing and expressing SEQ ID NO: 63 in any manner other than transforming a plant with SEQ ID NO: 29. The genetically modified seed encompasses any type of modification, and the specification does not provide guidance on such modifications. In the absence of guidance, undue experimentation would have been required by a skilled artisan at the time the claimed invention was made to determine how to produce a genetically modified seed by a method that comprises expression of SEQ ID NO: 63 without transforming the plant with a nucleotide sequence encoding SEQ ID NO: 63.

Accordingly, it is maintained that undue experimentation would have been required at the time the claimed invention was made to practice the invention commensurate in scope with these claims

5. Claim 40 remains rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, for the reasons of record stated in the Office action mailed on 10/20/2006. Applicants traversed the rejection in the paper filed on April 18, 2007.

Applicants state that a deposit of the transformed rice plant 1c-109-35 will be made during the pendency of the instant Application (response, page 9, lines 7-8). The rejection is maintained.

6. Claims 50, 53, and 54 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably

convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This rejection has been necessitated due to amendment in claim 50. Claims 53 and 54 are also rejected because they fail to overcome the deficiency of claim 50.

Claim 50 is directed to any nucleic acid sequence which increases or decreases the expression activity of SEQ ID NO: 63 in a genetically transformed plant. The specification does not have adequate written description for the genus of sequences which increase or decrease expression or activity of SEQ ID NO: 63 in a genetically transformed plant under current written description guidelines. Specification does not describe undisclosed structures of Applicant's broadly claimed genus, and one skilled in the art cannot reliably predict the structure of these sequences based upon the disclosure of SEQ ID NOs: 29 and 63.

Furthermore, Applicants have failed to correlate the structures of their broadly claimed genus to the function of increasing or decreasing the activity or expression of SEQ ID NO: 63. Further, Applicants have failed to describe conserved functional domains that are shared by these undisclosed structures encompassed by their broadly claimed genus. It is thus evident that Applicants have failed to reduce their broadly claimed genus to practice.

Accordingly, there is lack of adequate description to inform a skilled artisan that applicant was in possession of the claimed invention at the time of filing. See Written Description guidelines published in Federal Register/Vol.66, No. 4/Friday, January 5, 2001/Notices; p. 1099-1111.

Given the claim breadth and lack of guidance as discussed above, the specification does not provide written description of the genus broadly claimed. Accordingly, one skilled in the art would not have recognized Applicants to have been in possession of the claimed invention at the time of filing.

Claim Rejections - 35 USC § 103

7. Claims 38-40, and 50-54 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Buell et al. (EMBL/GenBank/DDBJ databases, Sequence Accession No. Q851M9, Published December 2001) in view of Jeon et al. (The Plant Journal, 22:561-570, 2000) for the reasons of record stated in the Office action mailed on 10/20/2006. Applicants traverse the rejection in the paper filed on April 18, 2007.

Applicants argue that Buell and Jeon fail to provide a disclosure, suggestion or motivation to combine these references to arrive at the presently claimed invention. Applicants further argue that neither Jeon nor Buell provide any motivation or suggestion to disrupt the claimed gene sequence (response, page 10, lines 7-20).

Applicant's arguments were fully considered but were not found to be persuasive. It is maintained that it would have been obvious for one of the ordinary skill in the art to disrupt Buell et al. nucleic sequence encoding an ammonium transporter by producing a T-DNA tagged line of rice plant using any method of gene disruption including the one taught by Jeon et al. It is further maintained that it would have been obvious at the time the claimed invention was made to use a gene-specific probe for the ammonium transporter gene derived from Buell et al. teachings to identify the T-DNA tagged line of rice comprising disruption in said ammonium transporter gene. The motivation to do so

comes from Jeon et al. who teach the usefulness of using T-DNA mutagenesis based approach for studying gene function. It is maintained that one of ordinary skill in the art would have been motivated to disrupt endogenous ammonium transporter gene through T-DNA mutagenesis approach of Jeon et al. to study the function of Buell et al. sequence with reasonable expectation of success.

It is important to note that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, one of ordinary skill in the art would have arrived at the instantly claimed invention by combining the teachings of Buell et al., and Jeon et al. with reasonable expectation of success.

Thus, it is maintained that the claimed invention as a whole is prima facie obvious over the combined teachings of the prior art.

8. Claims 50-55 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Buell et al. (EMBL/GenBank/DDBJ databases, Sequence Accession No. Q851M9 Published December 2001) in view of Valvekens et al. (PNAS, 85:5536-5540, 1988), and Howitt et al. (Biochimica et Biophysica Acta, 1465:152-170, 2000) for the reasons of record stated in the Office action mailed on 10/20/2006. Applicants traverse the rejection in the paper filed on April 18, 2007.

Applicants argue that neither Howitt nor Valvekens disclose or suggest the use or tagging of the instantly claimed gene sequence. Applicants further argue that there is no motivation found in any of the cited references to use the sequence of Buell to effect any purpose. Applicants further argue that Examiner has used hindsight reconstruction to arrive at the claimed invention. Applicants further argue that none of the references provide motivation to arrive at the claimed invention (response, page 11, lines 12-21).

Applicant's arguments were fully considered but were not found to be persuasive. It is maintained that it would have been obvious for one of the ordinary skill in the art to use Buell et al. nucleic sequence encoding the ammonium transporter, in a method of producing a transgenic plant and seed using any method of plant transformation including the one taught by Valvekens et al. It would have been obvious for one of the ordinary skill in the art to have been motivated to express Buell et al. nucleic acid sequence in a plant to produce a transgenic plant overexpressing said ammonium transporter. Given that Howitt et al. teach that ammonium transporters are involved in growth improvement in a plant through nitrogen uptake, one of the ordinary skill in the art would have been motivated to produce a transgenic plant expressing Buell et al. ammonium transporter for the purpose of improving growth and thereby increase the

yield of said transgenic plant. Obviously genetically modified transgenic seeds would have been produced for the purpose of propagation.

It is important to emphasize that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, one of ordinary skill in the art would have arrived at the instantly claimed invention by combining the teachings of Buell et al., Valvekens et al., and Howitt et al. with reasonable expectation of success.

It is maintained that the claimed invention as a whole is prima facie obvious over the combined teachings of the prior art.

Conclusions

9. Claims 38-40, and 50-55 remain rejected.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is set to expire within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinod Kumar whose telephone number is (571) 272-5444. The examiner can normally be reached on 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAVID H. KRUSE, PH.D.
PRIMARY EXAMINER

